



Charlotte Mason's House of Education,  
Scale How, Ambleside, UK, 2009

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## THE PHYSIOLOGY OF EDUCATION.

BY J. STRACHAN, M.D.

### PART II.

WE come now to the question of how the educator is to judge of these complex requirements and conditions of healthy growth and development, so that, while seeking to instruct and train the mind, he may secure good brain power to give due effect to his instructions. How is he to regulate brain action, so that it may be at all times in due relation to nutrition and the requirements of growth? Sir Lyon Playfair, on behalf of the authors of "the Code," professes to have gauged the powers of the average child, and thus adapted the requirements of "the Standards"; but he does not condescend upon particulars as to how they arrived at their conclusions. The question, however, is not one of attainment, but of school procedure. It matters little how high the standard at which the teacher may aim, so long as he employs only right methods in seeking to attain to it; whereas with wrong methods much harm may be done, with very poor educational results. It must be evident that age and apparent strength are no adequate or safe guides in this inquiry. Besides the many degrees of mental power as a whole, of which no estimate can be formed from outward appearances and the great variety of bent or speciality of power in different minds, many circumstances modify the determining conditions from hour to hour. Previous action, both mental and bodily, the time of day or night, the state of digestion, emotional feeling, slight ailments, etc., have an important bearing upon the action, suitable at the time, and require to be allowed for in regulating exercise. Then the multiplicity and extreme complexity of the mental powers must be taken into account, and care taken that all receive due consideration. Were the regulation of mental activity left to the arbitrary will of the teacher, what chance would there be of all these conditions and considerations being

duly observed? Fortunately there is another educator in the field, one who has all the knowledge and power which are of necessity wanting in the schoolmaster. After forming a human being in embryo, and bringing it through all its stages to the period of school life, Nature does not retire from the field, and leave the work to be taken up and completed by another. The provisions which have succeeded so far are still in force, and no less efficient for the future.

All our organs are of necessity automatic in their action; and almost all perform their functions, and look after their own well-being, without our consciousness or our being able to control them in the slightest degree. Only such as have external relations—the stomach, the muscles, and the mental powers—are in any way subject to the will, and these only as regards such relations. With them activity is automatic and self-governing as with the others; and the duty of the will is simply to guide and direct these activities in accordance with external relations. Organic conditions and requirements are intimated to the will, and the rule of the will is dominated by *instinctive feelings* springing directly from the part concerned. These may be classed as desire and pleasure, prompting to and discriminating action, on the one hand; and repugnance, satiety, fatigue, and pain, preventing or checking excessive or otherwise injurious action on the other. These instinctive feelings are a *perfect* index to organic and functional conditions and requirements at all times and under all circumstances. They are a necessary equipment of the animal organism, and throughout the whole animal kingdom are thoroughly effective in securing required conditions of life, however various or complex these may be.

In the young instinctive promptings are modified in accordance with the educational system designed and instituted by the great Teacher, having reference not only to present health and well-being, but also to *preparation for the coming life*. They thus indicate not only the amount of food required to meet the immediate requirements of vitality and repair and actual power according to available nutrient supply, but also the additional nutriment required for growth and the relative proportion in which plasma ought to be applied to repair and growth. It is to them that I would

direct the teacher for guidance in the task of properly regulating activity, so that he must lay his account to Nature, and cannot be got rid of. The child as are his limbs or organs, however, for a purpose, which is understood to have in view the teacher is understood to have in view. Like the law of gravitation, it is a hindrance, according as the activity is prompted and regulated. The teacher may substitute his own in directing activity, but it is a modification afforded by the child's own apply.

I need say nothing in support of this, since the complete efficacy is amply demonstrated wherever the conditions, left to follow the dicta of Nature, it is acted upon in the manner of the supposed requirements of the organism. We may then assume as granted that the child will and bodily exercise the *inclination* of instinct, are the best or only way in which analogy bears in regard to the child. We have first to note that the child's volume. Prominent as is the child's mind is even more constantly the child. It is an essential part of the child's equipment, whether or no it is exercised, and it is manifestly well out as water from a sponge. The child is impatient under restraint, which favour its natural flow. It is to reckon with its own force. If it be for good or ill, it is its own force.

When we analyse this activity in kinds, viz.:—1st, The acquisition of knowledge, evidenced by keen observation and questioning, along with the

direct the teacher for guidance in the otherwise impossible task of properly regulating activity in the young. In any case he must lay his account to deal with them, as they are there, and cannot be got rid of. They are as much a part of the child as are his limbs or his senses. They are there, however, for a purpose, which is the same as that which the teacher is understood to have in view, apart from examinations. Like the law of gravitation, they are either a help or a hindrance, according as they are with or against us. Activity as prompted and regulated by instinct needs only to be aided and directed in order to produce the highest results. The teacher may substitute his will for that of the child in directing activity, but in doing so he must follow the indications afforded by the child's feelings since his own do not apply.

I need say nothing in support of this view as regards the body, since the complete efficacy of these natural guides is amply demonstrated wherever the young are, under favourable conditions, left to follow the dictates of Nature. In a general way it is acted upon in the management of children, so far as the supposed requirements of mental education will allow. We may then assume as granted, that in the taking of food and bodily exercise the *inclinations* of the child, as prompted by instinct, are the best or only guide. Let us see how the analogy bears in regard to the mind.

We have first to note that mental activity is there in full volume. Prominent as is action of the body, that of the mind is even more constantly present in the waking hours of the child. It is an essential element in all games and amusements, whether or no these be accompanied by bodily exercise, and it is manifest in every word and act. It wells out as water from a spring, and like a stream, while impatient under restraint, it readily turns into channels which favour its natural flow. In any case the teacher has it to reckon with. If it be not with him it will be against him, and for good or ill, it is an ever-present and effective force.

When we analyse this activity, we find that it is of two kinds, viz. :—1st, The acquisition of knowledge and ideas as evidenced by keen observation, prying curiosity and frequent questioning, along with the immense store of knowledge of

common things, which is amassed without the aid, and notwithstanding the monopolising tendency of the school; and, 2nd, exercise, of such knowledge as is possessed, in play and amusement. Each is prompted by instinctive impulse directly connected with organic conditions, entirely analogous to those prompting the taking of food and bodily exercise. Analogous, too, are the objects sought to be attained, viz.:—Furnishing the mind with the pabulum that thought is made of, and without which there can be no mind; and securing for this the exercise and training required to render it efficient in the future. Is there any reason for withholding from mental activity, so prompted, the confidence we are so ready to place in analogous bodily activity? Do we know so much more of the physical action of the brain than we do of the action of the stomach and of the muscles, that we can afford to dispense with or oppose natural indications in the one case, although we, admittedly, cannot in the other? Are not the facts very much the other way? And is it not because we know so little that we presume so much?

Let us look at the two forms of mental activity so prominent in the child, and see how far they may meet the objects of education.

The child craves for knowledge not less ardently than he does for food; and, of his own free will and pleasure, imbibes all the information to be obtained from the every-day life of the community in which he lives; besides acquiring a fair command of at least one, sometimes two or three languages. No one who compares the knowledge and intelligence of a child six years of age with those of the same child at one or two can doubt the exceeding vigour and efficacy of this receptive mental activity, or dispute the existence of a natural desire or appetite for information. The question is whether this appetite is sufficient for the purpose of the teacher? What is this purpose? To supply the young mind with knowledge of a kind which, without his aid, the child would have no opportunity of learning. Very good! And how does he propose to get the child to accept of it? What difficulty, when the appetite is there ready to imbibe any suitable pabulum which may be placed before it? But the teacher may tell us that he does not find this appetite incline the

child to learn grammar rules, articles of conventional school upon the form of the rules, etc. The appetite for food does not force raw potatoes upon him, but we do not on potatoes, but we do not on considered. We boil the potatoes into a palatable form, when it is eaten without thought the teacher to present his pabulum with which he seeks to form as will engage the interest and pleasure. With regard to this, food can never be the best form to the child's mind, being as yet a distracting effort of mind to follow the word, which has been familiar to the mind, should always be as far as possible, by pictorial representation, suppose that digestion is impeded, food as that the mind is strengthened.

But as even boiled potatoes, if taken without stomach, so there may be mental indigestion, if cooking will render intelligible to the young mind. The only way is to leave it till the mind is sufficiently interested. To force it early is needless and injurious. Again, the teacher will fail to keep up the interest, just as it would be impossible to feed with a like continuous feed. In either case are limited, and the respect is the appetite. But the appetite is not nearly sufficient. The child requires to learn much by himself; one say with an arbitrary prescribed food upon some empirical taste or appetite. We know that it would be to injure the stomach with a like method when applied to knowledge is really imparted.

child to learn grammar rules, Latin exercises, and other articles of conventional school diet. This, however, reflects upon the form of the rules, etc., rather than on the appetite. The appetite for food does not incline the child to eat raw potatoes, but we do not on that account employ means to force raw potatoes upon him, however nutritious they may be considered. We boil the potato, and do it up in some palatable form, when it is eaten readily and with pleasure. So ought the teacher to present his grammar rules and all other pabulum with which he seeks to feed the child's mind in such form as will engage the interest, when it will be learned with pleasure. With regard to this, I would say that the printed word can never be the best form in which to present knowledge to the child's mind, being as yet unfamiliar, and requiring a distracting effort of mind to follow the meaning. The spoken word, which has been familiar from infancy, and goes direct to the mind, should always be used, and supplemented, as far as possible, by pictorial aids. It is as reasonable to suppose that digestion is improved by giving indigestible food as that the mind is strengthened by rendering learning difficult.

But as even boiled potatoes may be unsuited to the infant stomach, so there may be mental pabulum which no amount of cooking will render intelligible, and therefore interesting, to the young mind. The only sensible way to deal with such is to leave it till the mind is sufficiently advanced to receive it with interest. To force it earlier upon the memory is both useless and injurious. Again, the utmost efforts of the teacher will fail to keep up the interest of his pupils for hours together, just as it would be impossible to keep up the appetite for food with a like continuous feeding. The receptive powers in either case are limited, and the only possible indication in this respect is the appetite. But the teacher may tell us that this appetite is not nearly sufficient for his purpose, and that the child requires to learn much more than he is inclined for. So might one say with an arbitrary method of feeding, which prescribed food upon some empirical rule, without reference to taste or appetite. We know that the result of such feeding would be to injure the stomach and *starve* the child. So it is with a like method when applied to the mind. Far less knowledge is really imparted with this empirical stuffing

than might be with teaching conducted upon strictly natural lines.

Those who reject the appetite as a guide to instruction ought to be able to state what other indications they profess to follow. Or will they tell us, in so many words, that they require no indications other than their own arbitrary estimate of what the child ought to be able to learn, and which they can force him to learn? Is the implanting of knowledge in the human brain such a simple affair that it can be dealt with in this rough-and-ready, this brutal fashion? Such a statement would, in the light of physiology, carry with it its own condemnation, and the condemnation also of those who made it as unfit to be entrusted with the management of the growing human mind.

The acquisition of knowledge is but a part, and by far the smaller part, of spontaneous mental activity in the young; the other part, which embraces all their play and amusements, being exercise of the knowledge already possessed.

The idea, or item of knowledge, when implanted in the mind, seems to exert a modifying effect upon certain of the brain cells, which thereupon assume the nature and character of an organ having the evolution of the said idea as its function. This I look upon as the *psychical unit*, the aggregate of such ideas, acting together, and manipulated, so to speak, by the mental faculties, constituting our intellectual powers. Each idea is thus organic, and subject to organic laws. It requires exercise for development, and to keep it strong and vigorous; but this must be duly regulated in accordance with organic conditions at all times. Such exercise is prompted by instinctive impulse, and accompanied by feelings of pleasure, just as with the muscles. Hence the perpetual mental activity of the older child. In the young child where ideas are as yet few, this spontaneous exercise is the more easily studied. It is then seen that, while anything appealing to existing ideas, as the shaking of a rattle or the springing open of a watch, excites pleasure for a time, the child soon tires of it, and the same amusement will not be again effective till after a period of rest. Great part of the young child's time is spent in sleep or in mental apathy, there not being ideas sufficient to fill up the whole day. In the older child, again, ideas have become so numerous that they cannot all

find time for the exercise that becomes, to some extent, a matter of the fittest. Still, the exercise must never come short of, must never be in a condition at the time, otherwise weakened for the future, and amply provided for by inclining the muscles; and as with the mental powers, the tendency is the same. The office of the teacher is to direct activity into the most useful, that the parts of the mind are strongest in the future.

You may have observed reference to the subject of memory so largely in school work. Memory is upon memory as, properly, a record of sense impressions, mainly a record of sense impressions, a mental connexion with our past. As I wrote to you, I have not having regard to you, but better to deal with memory, to be dealt with in education, could, of course, give reasons for the present.

I have endeavoured to tell you before you what I take to be the natural principle of education—the natural principle for the coming life. I am not for the strict observance of the teaching profession, as with the children and for the new. The attitude which, I think, is inadmissible in the medical profession in the work in the young. The only effect, is to overcome the child to do what Nature has no safety in any system more than if the same. Deprived of this means

find time for the exercise they would willingly take, and it becomes, to some extent, a matter of selection and survival of the fittest. Still, the exercise of each, however it may come short of, must never exceed that suited to its organic condition at the time, otherwise the organism will be injured and weakened for the future. This regulation of activity is amply provided for by inclination, just as with the individual muscles; and as with the muscles, so with the ideas and mental powers, the tendency is to full development of the whole. The office of the teacher in this respect is to aid and direct activity into the most useful channels, on the principle that the parts of the mind most exercised in this way will be strongest in the future.

You may have observed the absence in this paper of all reference to the subject of memory, which, as a rule, bulks so largely in school work. The reason is that I do not look upon memory as, properly speaking, part of the mind, but mainly a record of sense perceptions, having only an incidental connexion with our thinking powers. I was sorely tempted as I wrote to bring in my views on this subject; but having regard to your time and patience, I thought it better to deal with memory as I think it ought, in the main, to be dealt with in education—leaving it out altogether. I could, of course, give reasons for this, but shall spare you for the present.

I have endeavoured in the time at my disposal to put before you what I take to be the basis of the true science of education—the natural process of preparing the young mind for the coming life. I am convinced that in the careful study and strict observance of this lies a great future for the teaching profession, as well as a happier and a better time for children and for the nation.

The attitude which, I think, ought to be taken up by the medical profession in the matter is to insist upon the total inadmissibility of punishment and prizes as applied to mental work in the young. The only object of such, as it is their only effect, is to overcome instinctive promptings—to induce the child to do what Nature tells him is wrong. There can be no safety in any system of which they form a part, any more than if the same were applied to the taking of food. Deprived of this means of forcing unsuitable, and therefore

repugnant, because injurious work, upon his pupils, the teacher would be obliged to fall back upon the natural action of the young mind and adapt his method to that, when a beginning would be made in scientific teaching. Then, and not till then, will payment by results be a safe and justifiable measure. As at present applied, the teachers themselves cry out against the iniquity of the system, declaring that it necessitates on the approach of inspection time an injurious amount of pressure upon the more backward pupils; and I know well, from personal observation, how much this is the case. So long as this is understood to mean only a little temporary suffering, or even illness, with compensating benefit from increased knowledge, it is not likely that even the Society for the Prevention of Cruelty to Children will concern themselves in the matter. But if it were distinctly stated and pressed upon the authorities by the medical profession that such pressure, and all pressure upon the delicate organism of the growing brain, is directly opposed to the objects of education, and certain to weaken the intellectual powers of the rising generation, then it might be hoped that something would be done to place the school system on a more safe and satisfactory footing.

# SONG A

## BY MAR

CLOSE together, with only  
quarry road and its two wal  
popple trees they perch in  
Blackcap Warbler. It is a

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